Spec. 4/24/56 ?

PERLITE

plaster aggregate

- lightweight
- insulating
- fire resistant

PERLITE — its origin and use...

Perlite is a siliceous volcanic rock mined in western United States. When crushed and quickly heated to above 1500° F., it expands to form lightweight, non-combustible, glass-like particles of cellular structure. This material, white or light gray in color, is about 1/10 the weight of sand or gravel.

Perlite aggregate consists of expanded perlite sized for use in lightweight fire retardant plaster or insulating concrete in place of sand or gravel. For easy handling and accurate on-the-job mixing, it is usually marketed in multi-wall paper bags of 3 or 4-cu. ft. capacity ready for use with cement or gypsum.

The many, tiny glass-sealed cells in each particle of expanded perlite make it highly insulating as well as comparatively non-absorptive. Thus perlite mixes with about 30% less water than comparable lightweight aggregates.

PERLITE INSTITUTE

45 W. 45th Street
New York 36, New York

A.I.A. FILE NO. 21-A-5 and 21-C-1

● BASE COAT PLASTER ● STRUCTURAL STEEL FIREPROOFING

PERLITE

Photomicrograph of expanded perlite particle shows glass-sealed air cells which provide insulation.

advantages

cuts dead weight—Perlite-gypsum plaster weighs only ⅓ as much as ordinary plaster . . . saves one ton of dead weight for every 100 sq. yds. of ½" thick plaster in residential construction . . . minimizes settling and cracking . . . cuts maintenance costs. When perlite plaster is applied over metal lath in multi-story buildings, it saves as much as 2 tons per 100 sq. yds. of plastered surface. Structural members and foundations carry less weight, and can thus be reduced in size and cost.

insulating—Countless tiny dead air cells in perlite aggregate are natural thermal insulators . . . give perlite plaster up to 4 times more resistance to heat transmission than ordinary plaster. Result: Greater all-year comfort for homes and offices, lower heating and air conditioning costs.

easy to use—Light weight simplifies handling. Plasterers cover more area per day with less effort. Perlite plaster does not compress under the trowel, and is easily darbied and rodded. Spreads readily on all types of bases, and dries faster with less shrinkage than comparable lightweight plasters. Low weight permits large quantities of aggregate to be stored inside on lightly supported floors. No waste, no shoveling off street, no frozen aggregate piles in winter.

long-lasting—Perlite plaster is highly resilient . . . minimizes cracks due to shock and impact, internal strains, earthquakes and settling. The finished plaster provides monolithic wall and ceiling surfaces that are ideal for painting or papering, permanent as the building itself.

specifications

Perlite-gypsum base coat plaster shall be applied in conformance to ASA Specification A42.1-1955. For convenience, the following short form may be used.

1. Perlite aggregate

For scratch and brown coats, perlite aggregate shall weigh not less than 7½ nor more than 15 lb per cu ft and particle gradation shall conform to ASTM Specification C 35-53 T. Bags shall display the Perlite Institute Certification Seal, by which the producer guarantees that the perlite was manufactured in conformance to ASTM Specification C 35-53 T.

2. Base coat application

All metal and wood lath surfaces and gypsum lath ceilings attached by resilient clips shall be three coat work. Unit masonry and nailed-on gypsum lath may be either three-coat or two-coat double-up work.

a. **Three-coat work**—First or scratch coat on all types of lath shall be not more than 2 cu ft of perlite to 100 lb of neat gypsum plaster. First coat on masonry surfaces except monolithic concrete, and second or brown coat in all three-coat work shall be not more than 3 cu ft of perlite to 100 lb of neat gypsum plaster. In three-coat work, the first coat should be cross-scratched and allowed to set 24 hours before the brown coat is applied.

b. **Two-coat work**—On all bases except wire, metal or wood lath and monolithic concrete, the mix for double-up work shall be 2½ cu ft of perlite to 100 lb of neat gypsum plaster.

For double-up work over masonry, the mix shall be not more than 3 cu ft of perlite to 100 lb of neat gypsum plaster.

On masonry bases exhibiting high suction, not more than 4 cu ft of perlite to 100 lb of neat gypsum plaster shall be used.

3. Finish coat application

The finish coat shall be applied to a partially dry base coat that has set firm and hard, or to a thoroughly dry base coat which has been evenly wetted by brushing or spraying. Application of lime putty, sand, texture or acoustical finish coats over perlite base coats shall conform to standard practice as was customary over sand plaster base coats.

recommended precautions

setting time—Perlite contains no impurities to hasten the setting time of gypsum. Therefore in areas where heavily retarded gypsum or slow setting gypsum is used, ***enough accelerator should be added to perlite-gypsum plaster to assure a setting time of less than four hours.*** Slower setting plaster may result in weak plaster, excessive shrinkage and needless cracking.

radiant heat—Perlite plaster provides excellent insulation. It should therefore *not* be used over radiant heat coils in ceilings.

mix ratios for fireproofing—Building code approved mix ratios of perlite and gypsum must be used in plaster for fire rated constructions. For correct mix ratios, see fire rating chart on page 3 or Perlite Institute booklet "Fireproofing with Perlite."

thermal conductivity*

mix	description	oven-dry density pcf	mean temp. °F	conductivity "k" †
2 cu ft: 100 lb	Perlite-gypsum scratch coat	44.4	75°	1.42
3 cu ft: 100 lb	Perlite-gypsum brown coat	39.2	75°	1.12
scratch coat: 2 cu ft: 100 lb *brown coat:* 3 cu ft: 100 lb	Built-up perlite plaster: ¼ in. brown coat, ¼ in. scratch coat on ⅜ in. gypsum lath; lime putty finish. Total thickness of panel: ⅞"	54.3	75°	conductance "c" 1.92

*From Pittsburgh Testing Laboratory Report, April 10, 1954.
†Btu/hr/sq ft/°F/in. thickness at mean temperature of 75°F.

sound reduction

type of construction	thickness	wt/sq ft	decibel reduction
Solid perlite-gypsum on metal lath and channels. First coat hand, balance machine applied.	2"	10.8 lb.	40.3*
Solid perlite-gypsum on ½" longboard gypsum lath core. Machine applied.	2"	10.3 lb.	42.3*
Solid perlite-gypsum on ½" longboard gypsum lath core. Hand applied.	2"	9.6 lb.	41.8*
Solid perlite-gypsum on metal lath and channels. First coat hand, balance machine applied.	1½"	7.5 lb.	32.7†
⅜" gypsum lath attached to 2 x 4 studs by resilient clips: faced on both sides with ½" of perlite-gypsum.	6⅛"	12.6 lb.	50.7†

*Riverbank Acoustical Laboratories †National Bureau of Standards

perlite plaster fireproofing

saves weight, labor and materials—Perlite-gypsum plaster offers the lightest, thinnest, most economical means available for achieving 2, 3, and 4-hour fire protection for structural steel framing, partitions, floors and roof decks.

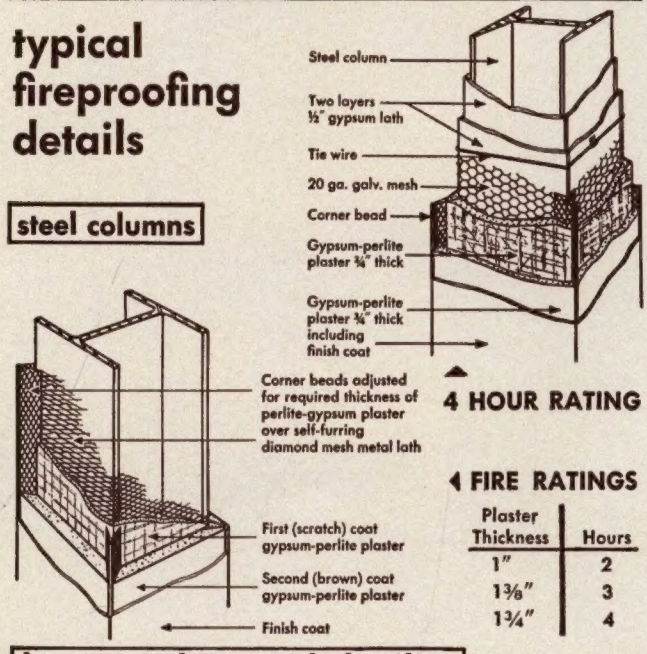
By suspending a lightweight perlite-gypsum plaster ceiling beneath structural members, the heavy individual concrete encasement of steel beams and girders can be eliminated. Simple "wrap around" constructions of lath and perlite plaster provide up to four hour ratings for steel columns. These inexpensive systems eliminate the costly erection and removal of concrete forms and cut the deadload of the fireproofing up to 80%. This weight reduction permits the use of smaller framing members and footings in multiple story buildings.

In addition to furnishing needed fire protection, perlite plaster provides a durable, attractive and highly popular interior finish.

Hundreds of square feet of rentable floor space can be added to commercial buildings, hotels, hospitals and apartments through the use of solid perlite plaster partitions. These sturdy 2 in. and 2½ in. partitions are only half as thick as the hollow type, resulting in substantial space savings, yet they provide up to 2-hour fire ratings and are strong, durable and crack resistant.

typical fireproofing details

steel columns

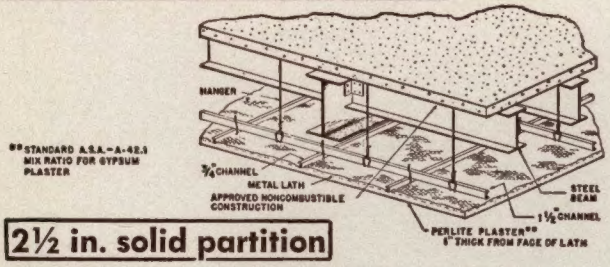


4 HOUR RATING

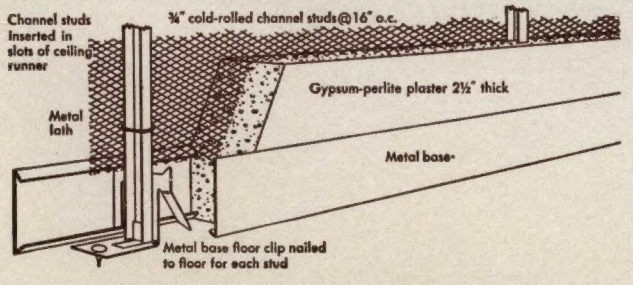
4 FIRE RATINGS

Plaster Thickness	Hours
1"	2
1⅜"	3
1¾"	4

beams and suspended ceiling



2½ in. solid partition



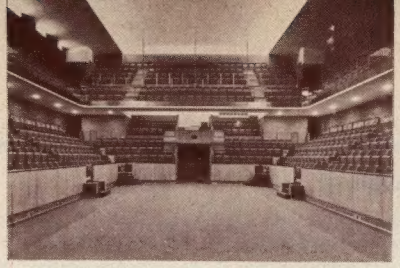
fire ratings—perlite-gypsum plaster

	hours resistance	plaster thickness	mix* and construction details	authority
STRUCTURAL STEEL COLUMNS				
metal lath	4	1¾"	2:1, 3:1; self-furring lath wrapped around column.	U.L. 3187-4
	4	1½"	2:1, 3:1; lath furred 7/16" from flanges by ¾" channels.	U.L. 3187-6
	3	1⅜"	2:1, 3:1; self-furring lath wrapped around column.	U.L. 3187-7
	2	1"	2:1, 3:1; self-furring lath wrapped around column.	U.L. 3187-5
	2	1"	2:1, 3:1; lath spaced 1¼" from flanges. No backfill.	U.L. 3187-2
gypsum lath	4	1½"	2:1, 3:1; two ¾" coats over two layers ½" gypsum lath, 1" hex mesh.	N.B.S. BMS-135
	4	2⅛"	2:1, 3:1; two coats, chicken wire between; one layer ½" gypsum lath.	U.L. 3329
	3	1⅜"	2:1, 3:1; ⅜" perforated lath.	name on request
	3	1½"	2½:1; two ¾" coats with 1" mesh between; one layer ½" gypsum lath.	N.B.S. BMS-135
	3	1"	2½:1; two layers ½" gypsum lath wrapped with 1" hex mesh.	N.B.S. BMS-135
	2	1"	2½:1; ⅜" perforated lath	N.B.S. BMS-135
WALLS AND PARTITIONS				
	4	5"	Panel or curtain wall. 4" perlite concrete exterior, 1" perlite-gypsum interior.	U.L. 2957
metal lath	4	4"	Non load-bearing 4" thick perlite concrete masonry units, cores filled.	U.L. 3302
	2	2½"	2:1, 3:1; Non load-bearing solid partition. Lath on ¾" steel channels.	U.L. 3453
	2	1"	4:1; Non-bearing hollow. Lath furred 1⅛" from 4" trussed steel studs.	Univ. of California
	1	1½"	2½:1; Non load-bearing solid partition. Lath on ¾" steel channels.	Ohio State U.
gypsum lath	1½	1½"	2:1, 3:1; 2" solid partition; ½" lath, ¾" plaster on each side.	name on request
	1½	½"	2½:1; Non load-bearing hollow partition. Wood studs. ⅜" perf. lath.	name on request
	1¼	½"	2½:1; Load-bearing hollow partition. Wood studs. ⅜" perf. lath.	name on request
	½	½"	2½:1; ⅜" perf. lath on one face of wood studs, plastered one side only.	U.L. 2896
FLOORS AND CEILINGS				
metal lath	4	1"	3:1; ceiling supended minimum of 3" under steel floor and beams.	U.L. 2993
	4	1"	3:1; Ceiling suspended minimum of 3" beneath incombustible roof structure.	U.L. 2993-S
	4	⅞"	2:1, 3:1; suspended ceiling pierced for ducts and electrical outlets. Cellular steel floor and beam construction above.	U.L. 3355
	4	⅜"–1⅝"	2:1, 2:1; ⅜" on face of lath in contact with corrugated steel form. Corrugations filled with plaster. 1½" plaster on beams.	U.L. 3413-4
	3	¾"	2:1, 3:1; rib lath tied to joists; perlite concrete floor slab above.	U.L. 3454-2
	1½	¾"	2:1, 3:1; lath nailed to wood joists. Wood floor above.	name on request
gypsum lath	4	1"	2:1, 3:1; 1" mesh over ⅜" perf. lath clipped to channels on o. w. steel joists.	N.B.S. BMS-141
	3	½"	2½:1; 1" mesh over ⅜" perf. lath clipped to channels on o. w. steel joists.	N.B.S. BMS-141
	3	⅝"	2:1, 3:1; ⅜" perf. lath reinforced by diagonal wires, clipped to channels on steel joists.	N.B.S. BMS-141
	2	½"	2½:1; ⅜" perf. lath reinforced by diagonal wire, clipped to channels on steel joists.	N.B.S. BMS-141
	1¾	½"	2½:1; 1" wire mesh on ⅜" plain lath nailed to wood joists, wood floor above.	name on request
	1½	1"	2:1, 3:1; ⅜" perf. lath clipped to ¾" channels on steel joists.	N.B.S. BMS-141
	1	⅝"	2½:1; ⅜" perf. lath clipped to ¾" channels on steel joists.	N.B.S. BMS-141
	1	½"	2½:1; ⅜" perf. lath nailed to wood joists supporting wood floor.	name on request

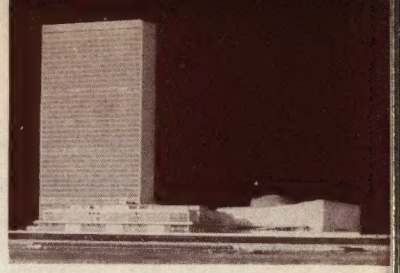
* Cu. ft. of perlite: 100 lb. bag of gypsum plaster.
N.B.S.—National Bureau of Standards. U.L.—Underwriters' Laboratories.
For details, write for booklet "Fireproofing with Perlite.

INSULATING perlite plaster basecoat was used throughout the fabulous Fontainbleau Hotel in Miami Beach.

LIGHT WEIGHT, easy-to-handle perlite plaster was chosen for new Toledo Health Center.



DURABLE perlite plaster has been time tested over 6 years in Grand Rapids Masonic Temple.



FIRE RETARDANT membrane of perlite plaster protects steelwork of United Nations Building, New York.

Look for this seal to be sure!

specify *certified* perlite . . .

Perlite is the only plaster aggregate impartially certified and guaranteed to conform to ASTM Specification.

The Perlite Institute Certification Seal on bags of perlite is a positive guarantee of quality and uniformity. It protects the architect, the plasterer and the building owner by providing a reliable means of identifying brands of perlite which are rigidly quality-controlled to meet the specification of American Society for Testing Materials.

Producers who display the seal are licensed by the Perlite Institute, and their perlite production is regularly sampled and tested by the impartial Pittsburg Testing Laboratory to insure strict conformance to ASTM Specification C 35-53 T—the nationally accepted standard for plaster aggregate.

Perlite Products Company

Manufacturers of

Superlite Perlite

Primos, Delaware Co., Pa.

MAdison 6-2113